sion relationship in Fig. 5 more than they resemble the typical stress–strain curve for an ordinary rubber (broken curve in Fig. 5).

It does not seem to have been suggested before that elastomers can operate on the basis of interfacial forces, and we propose to call such an elastomer a liquid drop elastomer. In the ideal case, the interior of the drops would be completely fluid so that no orientation could be imposed on it during deformation of the droplets; the interfacial forces would be the only restoring force. The ideal case will be difficult to obtain but it should be possible to prepare synthetic elastomers of the mixed type in which both interfacial forces and changes in configurational entropy contribute to the elastic force, as suggested here for elastin.

In biology, one advantage of a liquid drop elastomer is that one can imagine the existence of elastic fibrils of much smaller diameter than is possible for rubberlike elastomers, because a single linear row of interlinked globular molecules would show an elastic behaviour which is similar to that of a larger aggregate of globules. Such elastic microfibrils could contribute to the mechanical behaviour of many cell types although their presence would be difficult to demonstrate.

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Role of Macrophages in the Development of Immunological Maturity in Rat

MOST neonatal mammals are unable to produce antibodies after antigenic stimulation possibly because of a deficiency in a link in the chain of events which leads to the production of antibodies. The aim of this study was to ascertain the part played in the immunological immaturity of infant rats by the inability or deficiency in antibody production by macrophages.

Peritoneal cells were collected by rinsing the peritoneal cavities of adult rats without previous treatment with heparinized Parkers medium. The washings were kept ice cold and centrifuged for 5 min at 1,500 r.p.m. The cells of the sediment were counted, their viability was checked by the trypan blue exclusion test and they were then stained for differential counting. Appropriate amounts of cells (from 12 to 36×10^6), suspended in 0·05 ml. Parkers medium with 20 per cent horse serum, were injected intraperitoneally into one day old Wistar rats; several rats of each litter, injected with the suspending medium without cells, served as controls. Two days later, all the rats (experimental and controls) were injected intraperitoneally with 0·05 ml. 20 per cent sheep red blood cells (SRBC). The peritoneal cells used for inoculation consisted of 70 per cent macrophages (60–82 per cent), 6 per cent lymphocytes (3–9 per cent) and 21 per cent granulocytes (12–30 per cent). Their viability was more than 90 per cent. Blood was drawn by heart puncture every 3–4 days, beginning from the fourth day of immunization, and the haemolysin content of the serum was determined by the micromethod of Takatsy. In several experiments, the infant rats were killed on the fourth day of immunization and their spleens were examined for plaque forming cells (PFC) after the method of Jerne modified by Sterzl. The results are shown in Table 1. The use of rats for this experiment is convenient because they do not have natural antibodies to SRBC, therefore no passive transfer of maternal antibodies can occur. Our rats can produce antibodies when twelve days old.

Table 1. ANTIBODY RESPONSE OF INFANT RATS TO SRBC AFTER INOCULATION WITH MACROPHAGES FROM ADULT RATS

Series	No. of infant rats	No. of macrophages injected $\times 10^6$	No. of rats showing haemolysins
1	6	12	6
	4	0	0
2	5	12	5
	2	0	0
3	5	13	2
	4	0	0
4	3	14	2
	3	0	0
5	5	16	2
	3	0	0
6	3	26	3
	2	0	0
7	3	36	3
	2	0	0
8	2	13*	2
	2	0	0
9	3	13*	3
	2	0	0
10	2	13*	2
	2	0	0

* Macrophages detached after incubation on glass dishes.

Thirty of thirty-seven inoculated infant rats, which were injected with adult peritoneal cells before the antigenic stimulus, produced haemolysins in a titre of 1:4–1:512. The titre began to rise on the fourth day after the antigen and reached the peak on day 10–15. PFC (3–63/spleen) were found in the spleens of eight rats that were killed on the fourth day after the antigen. The controls which had been inoculated simultaneously with SRBC but without macrophages did not respond to the antigenic stimulus, neither by elaborating haemolysins nor PFC.

In several instances, the peritoneal cells were incubated on glass dishes, detached after 1 h with a rubber policeman and rinsed before being used to inoculate infant rats; the detached cells, devoid of non-adherent elements (that is lymphocytes and granulocytes), also induced an antibody response in infant rats.

It seems justified to assume therefore that adult, functionally adequate macrophages are the necessary prerequisite for initiating the production of antibodies to SRBC in infant rats.

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